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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/831,849	07/19/2001	Mark A. Hayes	A32014-PCT-US	9796

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EXAMINER	
CHOI, LING SIU	
ART UNIT	**PAPER NUMBER**
1713	

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/831,849	HAYES ET AL.	
	Examiner	Art Unit	
	Ling-Siu Choi	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *13-16* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 17-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07/19/2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *08/23/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action is in response to the Response to Restriction Requirement filed December 2, 2004. Claims 1-12 and 17-19 have been elected for the further prosecution on the merits.

Claim Rejections - 35 USC § 103

2. **The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:**

> **(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.**

3. Claims 1-12 and 17-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Ewing et al. (US 5,358,618).

The present invention relates to a device for performing fluid flow, comprising

(1) a capillary channel	an innert wall surface
	two ends
	a cross section of less than about $200x10^{-9}$ square meters
(2) integrated external electrode(s)	spaced apart from the inner wall surface of the capillary channel by a distance of less than about 160×10^{-6} meters to provide a perpendicular voltage field to the capillary channel
(3) two longitudinal electrodes	positioned at the intermediate ends of the capillary channel to provide a longitudinal voltage field through the capillary channel

(summary of claim 1)

Ewing et al. disclose an electrophoretic separation apparatus including a capillary tube having a length, a cross section, an inlet, and an outlet, wherein a first reservoir containing a solvent and a solute introduced by injection is in fluid flow communication with the outlet and a second reservoir containing at least a solvent is also in fluid flow communication with the outlet (abstract; claim 1; Figure 1). Ewing et al. further disclose that a first power supply means provides a separation potential between the first and the second reservoirs and along the length of the capillary to thereby establish an electrophoretic flow of the solute therethrough and a second power supply means juxtaposed to an external surface of the capillary tube provides an electrostatic field accross the cross section of the capillary tube to control the electroosmotic flow therein (abstract; claim 1; Figure 1). Ewing et al. furthermore disclose that a non-absorptive coating on the interior of capillary provides a tolerance to the solution having a higher pH (col. 7,

lines 35-42). Ewing et al. also disclose the size of the capillary and the a longitudinal votage (col. 4, lines 56-68).

The difference between the present claims and the disclosure of Ewing et al. is the requirement of a specific distance between two juxtaposed electrodes.

Ewing et al. disclose that the use of the juxtaposed electrodes is to control the electroosmotic flow, which is effective factors in improving electrophoretic resolution and efficiency and in obtaining reproducible result in the capillary zone electrophoresis (CZE) apparatus (col. 1, lines 19-25 and 45-49; col. 2, lines 40-57). The case law held that "where the general conditions of a claim are disclosed in the prior art, it is not inventive to disclose the optimum or workable ranges by routine experimentation." ***In re Aller***, 220 F.2d 454 456, 105 USPQ 233, 235(CCPA 1955). The case law further held that "a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." ***In re Antonie***, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Since the electroosmotic flow is controlled by the juxtaposed electrodes, the effect depends on the distance between the juxtaposed electrodes if all experimental conditions are maintained the same. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply an optimum distance which falls into the claimed range to the juxtaposed electrodes in the disclosure of Ewing et al. and thereby obtain the present invention.

4. Claims 1-12 and 17-19 rejected under 35 U.S.C. 103(a) as being unpatentable over

Ghowsi (US 5,092,972).

Ghowsi discloses a microchip comprising (a) an electrical insulator having a capillary bore therein, the capillary bore having first and second ends, which are capable of accommodating at least a portion of the liquid; (b) means for applying a first voltage between the first end and the second end of the capillary bore; and (c) means for applying a second voltage between a point within the insulator and a point within the capillary bore, which comprises an electrical conductor in the contact with the insulator (claim 1). Ghowsi further discloses that the second voltage changes the charge on the wall of the capillary, and thus allows manipulation of the zeta potential within the capillary, which, in turn, permits flexibly and rapidly controlling the rate of electroosmosis (col. 3, lines 33-39). Ghowsi furthermore disclose the first voltage (V_d) and and the second voltage (V_G) (col. 5, lines 40-45; col. 6, lines 11-29; col. 7, lines 28-44).

The difference between the present claims and the disclosure of Ghowsi is the requirement of a specific distance between second electrodes.

The case law held that "a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation." ***In re Antonie***, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Since the electroosmotic flow is controlled by the second electrodes, the effect depends on the distance between the second electrodes if all experimental conditions are maintained the same. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply an optimum distance which falls into the claimed range to the second electrodes in the disclosure of Ghowsi and thereby obtain the present invention.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reach on 571-272-1114.

LING-SUI CHOI
PRIMARY EXAMINER

February 18, 2005